*Please provide the following information, and submit to the NOAA DM Plan Repository.*

**Reference to Master DM Plan (if applicable)**

*As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.*

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

**1. General Description of Data to be Managed**

**1.1. Name of the Data, data collection Project, or data-producing Program:**
2013 USACE Topographic Lidar: Rio Puerto Nuevo (PR)

**1.2. Summary description of the data:**
This data set is an LAZ (compressed LAS) format file containing LIDAR point cloud data. The NAD83/2011 geodetic products were delivered as individual LAS files representing the geographic extent of each uniquely identified and acquired flight line or lift. USACE regularly uses digital topographic information to support regulatory, land management and acquisition, planning, engineering and habitat restoration projects.   The data were classified into 4 classifications; (1) unclassified, (2) ground, (9) water,and (12) overlap points.   The full study area of approximately 404 square km was processed. The tiles are 1,000 x 1,000m in size and Final deliverables were provided as geographic coordinates referenced to the North American Datum of 1983/2011 Realization (NAD83/2011) and as projected coordinates referenced to the State Plane Coordinate System, Puerto Rico Virgin Islands FIPS Zone 5200, NAD83/2011, vertical PRVD02 orthometric height.

Upon arrival to NOAA's Office for Coastal Management the data were converted from State Plane to geographic and from NAVD88 (orthometric) heights in feet to GRS80 ( ellipsoid) heights in meters using Geoid 12a.  Original project title was "2013 Greater San Juan, Puerto Nuevo, Rio de la Plata".

**1.3. Is this a one-time data collection, or an ongoing series of measurements?**
One-time data collection

**1.4. Actual or planned temporal coverage of the data:**
2013-10-27 to 2013-11-03

**1.5. Actual or planned geographic coverage of the data:**
W: -66.159, E: -66.026, N: 18.484, S: 18.348

**1.6. Type(s) of data:**
*(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)*
las

**1.7. Data collection method(s):**

*(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)*

**1.8. If data are from a NOAA Observing System of Record, indicate name of system:**

**1.8.1. If data are from another observing system, please specify:**

## 2. Point of Contact for this Data Management Plan (author or maintainer)

**2.1. Name:**
NOAA Office for Coastal Management (NOAA/OCM)

**2.2. Title:**
Metadata Contact

**2.3. Affiliation or facility:**
NOAA Office for Coastal Management (NOAA/OCM)

**2.4. E-mail address:**
coastal.info@noaa.gov

**2.5. Phone number:**
(843) 740-1202

## 3. Responsible Party for Data Management
*Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.*

**3.1. Name:**

**3.2. Title:**
Data Steward

## 4. Resources
*Programs must identify resources within their own budget for managing the data they produce.*

**4.1. Have resources for management of these data been identified?**

**4.2. Approximate percentage of the budget for these data devoted to data management ( specify percentage or "unknown"):**

## 5. Data Lineage and Quality
*NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality,*

*objectivity, utility, and integrity of information which it disseminates.*

**5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible**
*(describe or provide URL of description):*

Process Steps:

- 2014-01-01 00:00:00 - All flights for the project were accomplished with a single-engine Cessna 206 which provided an ideal, stable aerial base for LiDAR acquisition. This platform has relatively fast cruise speeds that are beneficial for project mobilization and demobilization while maintaining relatively slow stall speeds which can prove ideal for collection of a high-density, consistent data posting. IPAS-TC software was used to compute Inertial SOL file to process the final LiDAR LAS files. The method works by integrating Inertial Navigation Solution by processing IMU data and the simultaneously collected GPS data from SPAN System (Position and Orientation System/Airborne Vehicle) along with observables of locally positioned GPS base station on the ground. It computes a carrier phase GPS solution and then blends it with inertial data. This project's data was processed in strip form, meaning each flight line was processed independently. Processing the lines individually provides the data analyst with the ability to QC the overlap between lines. Each strip was imported into a project using TerraScan (Terrasolid, Ltd.) By creating a project the various flight lines are combined while breaking the dataset as a whole into manageable pieces. This process also converts the dataset from Geographic Coordinate System (NAD 83, 2011) to NAD83, 2011 Puerto State Plane. The ellipsoid height values will be converted to PRVD02, Meters, orthometric values using Geoid 12A, provided by National Geodetic Survey (NGS). Breaklines are collected manually, based on the LiDAR surface model in TerraModeler version 013. The classification of points as either water or ground is determined based on a combination of factors in the data: point density, voids in data returns, and flatness of the surface, and intensity value. Auxiliary information, such as the imagery provided by USACE, as well as ESRI's Hydro layer is used as an additional aid in decision making.
- 2014-01-01 00:00:00 - Survey check points were collected in the following two areas: Rio de la Plata (West Area) and Puerto Nuevo Project (East Area). Spread across each area 15-20 survey check points for each of the following classes were collected. The five classes were: DESCRIPTION - FEATURE CODE a. Open/Low Grass - OLG b. Tall Grass/Crops - TGC c. Brush/Low Trees - BLT d. Forest - FOR e. Wetlands - WET Overall, 201 points were collected as described in the table below (This tables includes landscape class points, but does not include the additional points collected for vertical and horizontal control). The additional points and accuracy calculations are provided in the accuracy assessment portion of this report. The two landscape classes with dense tall grass vegetation (Brush/low trees and Tall Grass/Crops) tested at higher than the target accuracy. Based on the thick vegetation, the LIDAR points that got to the ground in these areas were minimal, and aggressive filtering and manual edits were required in order to remove the dense vegetation from the ground point classification. As a result, the ground points in these areas were

sometimes tens to hundreds of meters apart. The distance of the ground points in these locations resulted in a triangulatedtest surface that may not represent the small terrain variations around the control survey points.   Although a particular LiDAR point cannot be tested, accuracy statements can be made about the performance of the ABGPS, IMU and LiDAR sensors. The ABGPS data are quality controlled by solutions from base stations. On this project, these solutions all agreed to better than 5 cm horizontally. The IMU sensor combines the post-processed GPS data with the raw inertial data to produce a best estimate of trajectory. Automated quality control checks will not allow the IMU solution to be of a lower accuracy than the provided input from the GPS solution. The altitude of the ALS70-CM sensor (S/N 7169) on this project was 1250-meters AGL providing a spot size of 29 cm in diameter. Each return is located somewhere within the spot on the ground, meaning the location of the point is located within 14.5 cm of the center of the spot. - 2014-10-20 00:00:00 - The NOAA Office for Coastal Management (OCM) received the files in laz format from USACE . The files contained lidar elevation and intensity measurements. The data were in State Plane, NAVD88 (orthometric) heights in feet. OCM performed the following processing for data storage and Digital Coast provisioning purposes: 1. The data were converted from State Plane coordinates to geographic coordinates. 2. The data were converted from NAVD88 (orthometric) heights in feet to GRS80 (ellipsoid) heights in meters using Geoid 12a. 3. The LAS data were sorted by latitude and the headers were updated.

**5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:**

**5.2. Quality control procedures employed (describe or provide URL of description):**

### 6. Data Documentation
*The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.*

**6.1. Does metadata comply with EDMC Data Documentation directive?**
No

**6.1.1. If metadata are non-existent or non-compliant, please explain:**
Missing/invalid information:
- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed

- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

### 6.2. Name of organization or facility providing metadata hosting:
NMFS Office of Science and Technology

#### 6.2.1. If service is needed for metadata hosting, please indicate:

### 6.3. URL of metadata folder or data catalog, if known:
https://www.fisheries.noaa.gov/inport/item/49954

### 6.4. Process for producing and maintaining metadata
*(describe or provide URL of description):*
Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

## 7. Data Access
*NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.*

### 7.1. Do these data comply with the Data Access directive?

#### 7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

#### 7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

### 7.2. Name of organization of facility providing data access:
NOAA Office for Coastal Management (NOAA/OCM)

#### 7.2.1. If data hosting service is needed, please indicate:

      **7.2.2. URL of data access service, if known:**
          https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=4711
          https://coast.noaa.gov/htdata/lidar1_z/geoid18/data/4711

    **7.3. Data access methods or services offered:**
    This data can be obtained on-line at the following URL:

    https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=4711;

    **7.4. Approximate delay between data collection and dissemination:**

      **7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:**

## 8. Data Preservation and Protection
*The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.*

    **8.1. Actual or planned long-term data archive location:**
    *(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)*

      **8.1.1. If World Data Center or Other, specify:**

      **8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:**

    **8.2. Data storage facility prior to being sent to an archive facility (if any):**
    Office for Coastal Management - Charleston, SC

    **8.3. Approximate delay between data collection and submission to an archive facility:**

    **8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?**
    *Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection*

## 9. Additional Line Office or Staff Office Questions
*Line and Staff Offices may extend this template by inserting additional questions in this section.*